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ABSTRACT

Cable systems, used alone or in conjunction with other systems, can provide valuable and economical services to government, education, health care, and some business organizations. Closed-circuit broadcasts are particularly efficient when they are used to replace the transportation of clients or employees. Planning of such systems on a regional basis is deterred by the lack of appropriate planning agencies, by regulatory and competitive confusion, and by financial risk. In some cases, regional telecommunication systems can simultaneously use existing cable television facilities. The appendixes of this document show the results of surveys of Hamilton County, Ohio and Metropolitan Nashville which examine user needs and areas of interest for telecommunications. (EMH)

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INTEGRATED TELECOMMUNICATIONS PLANNING

FOR METROPOLITAN AREAS

- Carl Pilnick, President
Telecommunications Management Corp.

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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1. INTRODUCTION

Telecommunications Management Corp. has served as cable system consultants to a number of major U.S. cities and counties. In this role, TMC's prime responsibility was:

- to analyze the technological and economic feasibility of various cable system alternatives, and to recommend those considered best for the metropolitan area in question;
- to explore and evaluate new communications services that might also be provided, either by the cable system alone, or in conjunction with other networks.

The latter task included a needs survey of various potential user groups (generally, government, education, health care and a sampling of business organizations). The results of this survey were utilized to determine, as a first approximation, whether the benefits appeared to justify the incremental costs of providing the new services.

Although this was far from the intent of the effort, what resulted in many cases was the first attempt at integrated telecommunications evaluation and planning in each of the involved metropolitan areas, across a user spectrum that included the public, quasi-public and private sectors

2. TELECOMMUNICATIONS NEEDS

Examples of the surveyed user needs and areas of interest for telecommunications services are given in Appendices A and B for the following two metropolitan areas:

(a) Hamilton County, Ohio -- This includes the City of Cincinnati and 48 other independent government units. The County population is split almost evenly in half, with about 450,000 in Cincinnati and 470,000 throughout the remainder of the County.

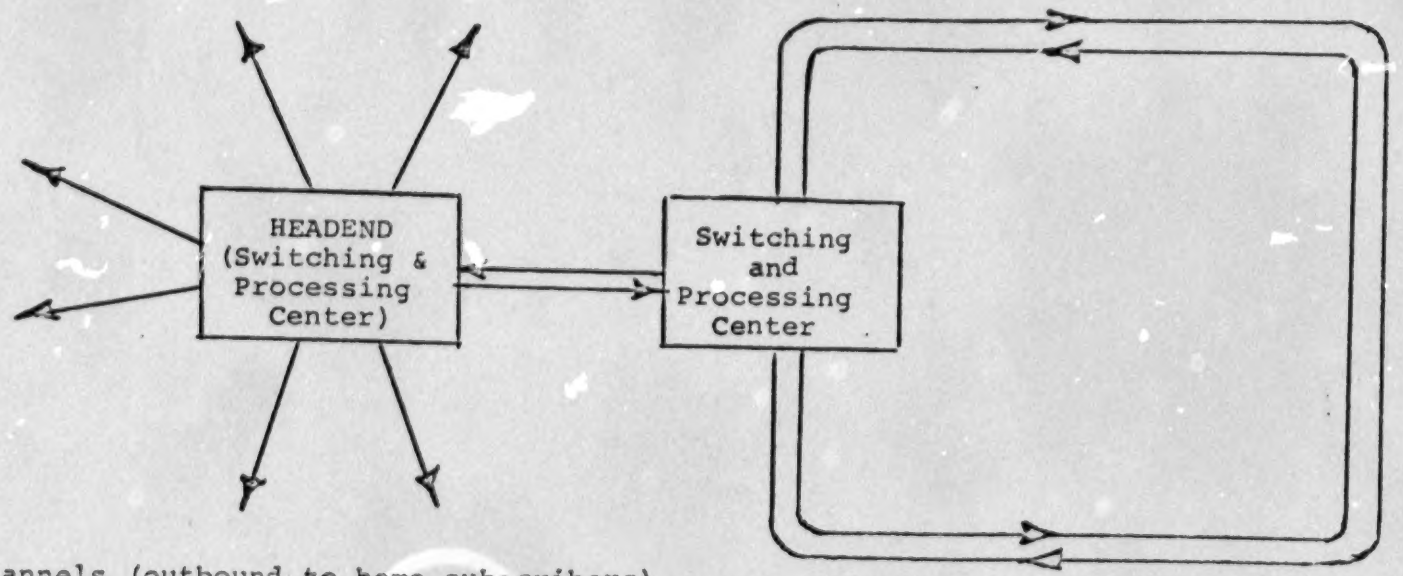
(b) Metropolitan Nashville and Davidson County, Tennessee -- Nashville and Davidson County are served by a consolidated government, and, jurisdictionally, would represent the opposite extreme from Hamilton County. The County population is about 450,000.

Technologically, a broadband, two-way cable network can provide virtually all of the services of interest (with the exception of communications to citizens at home) at relatively modest cost (estimated at about $2,000,000-5,000,000 capital investment for a limited, closed-circuit system in most metropolitan areas).

Figure 1 illustrates a dual-purpose cable system for New Orleans, in which one element is a two-way institutional communications network.

SUBSCRIBER NETWORK
ENTERTAINMENT (PARTY-LINE)

INSTITUTIONAL NETWORK
(CLOSED-CIRCUIT, PRIVATE CHANNEL)



- 30-35 Channels (outbound to home subscribers)
- $20-30M Capital Investment
- Requires 35% Subscription @ $7/month to be profitable
- Economic Outlook: Fair to Poor
- Implementation: Simple
- Options: (1) Commercial Franchisee

- 30-35 Channels (Inbound & Outbound among institutions)(Any channel can be divided into subchannels for data communications
- $3-4M Capital Investment
- Requires $1-1.5M Annual Revenue to be profitable
- Economic Outlook: Good to Excellent
- Implementation: Complex
- Options: (1) Commercial Franchisee
  (2) User Consortium
  (3) Public Corporation
  (4) City

FIGURE 1

PROPOSED NEW ORLEANS

CABLE SYSTEM

It can also be shown that the direct cost benefits of many of the desired services can be substantial. As examples:

° Almost all Fire Departments contacted indicate that a communications link which provided video programming from a training academy to firemen at each fire station, with a voice answer-back capability, would be extremely useful in permitting some personnel training to be achieved without transporting men to a central location. In New Orleans, such a video-out, audio-return link to 45 fire stations would cost about $750,000 a year, either via common-carrier circuits, or if the Fire Department were to construct a dedicated network.

With a shared network, above a 50% utilization threshhold, the cost for equivalent capability would be about $50,000 a year. At a 20-hour-per-week usage, this is equal to $50 per hour communications cost, which is much less costly than moving personnel.

This is an example of dollars already being budgeted and expended, with a relatively simple tradeoff of communications costs against transportation costs. Also, no interdepartmental jurisdictions or role

changes are involved, which would minimize either institutional or personal inertia.

- A more complex example, in which the potential for cost savings is large, but which does involve different jurisdictions, is that of telecommunications services among the various law enforcement and criminal justice agencies within a metropolitan area. This is particularly critical since both City agencies (police) and County agencies (Courts, District Attorney) have prerogatives and responsibilities that are many times jealously guarded.

Figure 2 illustrates a City/County network linking the major public safety, law enforcement and criminal justice agencies in a metropolitan area. With such a network, many completely new tradeoffs of communications vs. transportation become possible:

-- Video Arraignment of Suspects in which two-way video links between a courtroom judge and remote jail facilities can be used for routine arraignments.

-- Video Testimony by Police Officers in which police officers can testify via two-way video from divisional locations, rather than wait for hours in courtrooms

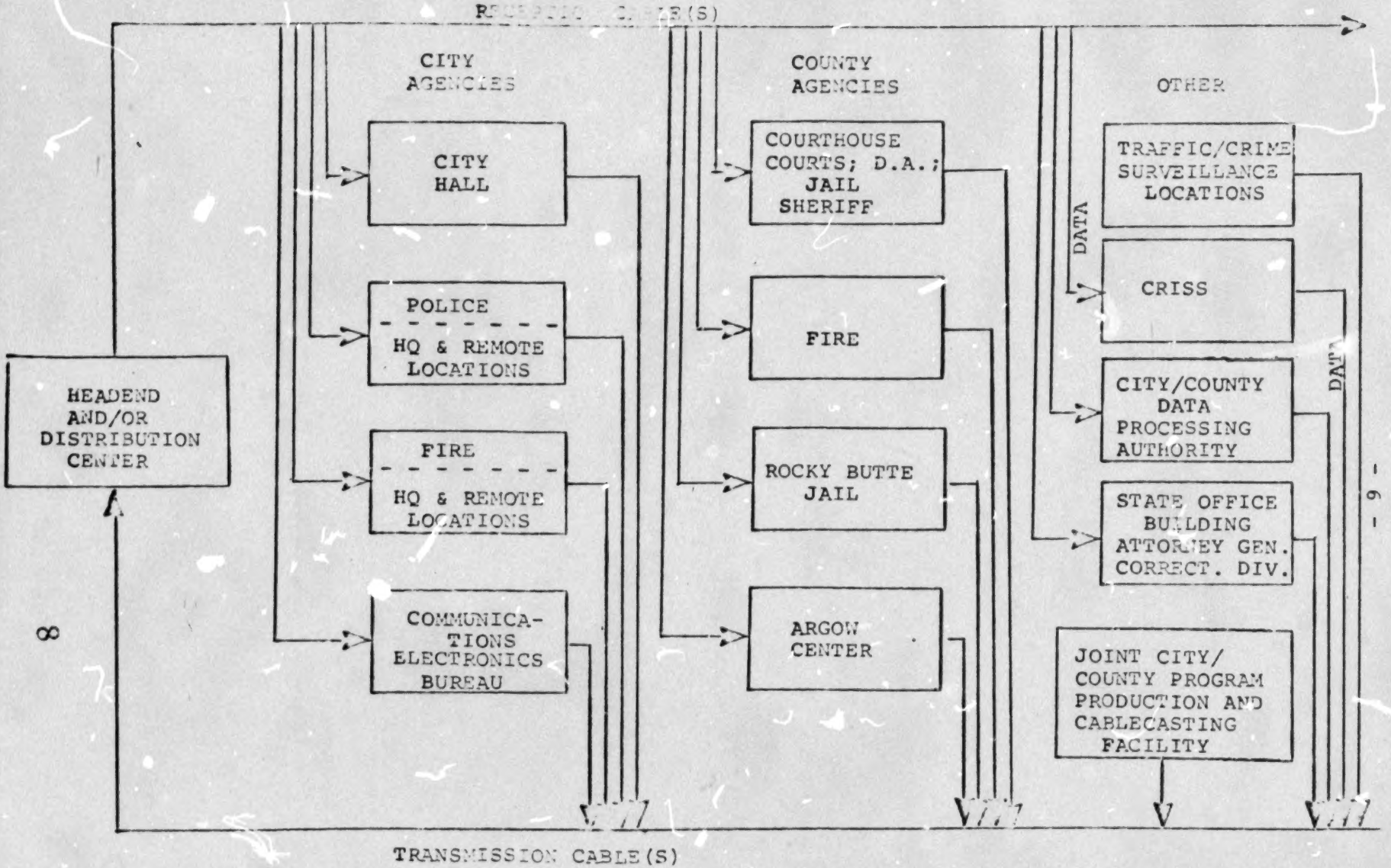


FIGURE 2

CITY/COUNTY PUBLIC SAFETY, LAW ENFORCEMENT AND CRIMINAL JUSTICE NETWORK

(City of Portland and Multnomah County)

waiting to be called. This could be limited to minor or routine cases, where the rights of the accused do not require direct confrontation. (In Cincinnati, this capability alone was considered to have the potential of saving $1,000,000 a year in police overtime pay.)

-- Legal Teleconferences among any of the network participants.

-- Record Transfer-the network could transfer, on a point-to-point basis, either documentary records (via facsimile) or computer data (via teleprinter or CRT terminals).

-- Education and Training to inmates, guards, police or fire officers, from external sources (e.g., colleges), or as in-service training.

Many other examples can be given, involving telecommunications services in education, health care and business, as well as in government. In general, these tend to reinforce the findings that:

° Integrated telecommunications planning and provision of services can provide direct cost savings and operational efficiencies,

sufficient to justify the cost. In other words, the necessary dollars not only exist but, in many cases, are now being spent ineffectively.

- A shared-use, broadband network covering a metropolitan area can be justified on the basis of present need and expenditures, rather than future speculation.
- No major technological barrier exists to providing the needed services, at competitive cost.

The barriers, therefore, are not technological, or economic, but rather institutional, as might be expected.

3. CONSTRAINTS

The institutional constraints that combine to inhibit regional telecommunications planning are not different in kind from those that impact on other aspects of regional planning such as transportation and land use. A more dynamic technology, however, does make extremely critical the time frame in which decisions must be made, and consequently narrows the "window" available for interjurisdictional action. In this respect, effective regional planning may be more difficult to achieve, even after an appropriate infrastructure has been established.

It has been noted that the metropolitan areas that were studied (including Portland, Ore., and New Orleans as well as Cincinnati and Nashville) have not made a conscious decision in

favor of regional telecommunications planning. Rather the reverse was true, in which the survey of needs was used to determine if an "add-on" to an entertainment-oriented cable system could be justified. Once an affirmative conclusion is reached, the institutional constraints must be considered to ascertain if, and how, an integrated network can supply the desired services.

No argument is advanced in favor of this approach, but it may be noted that it might well lead to de facto regional telecommunications planning and, more importantly, implementation of services considerably in advance of any other approach now on the horizon.

Nevertheless, the problems are formidable, and include the following:

- No formal, continuing planning structure -- With the exception of a few regions, such as the Twin Cities with its Metropolitan Council, no metropolitan-area bodies exist with telecommunications planning responsibility. The cities and counties noted above hope that a system operator, with entrepreneurial incentive, will in effect assume such responsibilities.
- Regulatory and competitive confusion -- Many of the desired services will compete with those of common carriers. The shared-user, broadband metropolitan loop offers a cost advantage that

has already aroused active opposition from AT&T, and this can be expected to increase. The question of whether an institutional communications network in a metropolitan area, which is interconnected to a home entertainment cable network, could be classified as a cable TV system, a common-carrier, or some new beast, has yet to be answered definitively. Given this quagmire, added to the fact that most cable system operators consider themselves in the entertainment, and not the communications, business, it is no easy task to find both a motivated and a qualified volunteer to operate and manage an integrated telecommunications network.

- Financial risk -- The cost advantages of a shared-user regional network are achieved only after some threshhold level of users are participating, just as in timesharing a computer. Until that level is reached, money is lost, either by the operator in subsidizing lower rates to attract more users, or by the users if true system costs are charged.

This situation is not dissimilar to others in which entrepreneurial risk is involved, and in the telecommunications field the examples

of specialized carrier networks such as MCI and Datran may be cited. In the localized, metropolitan regions, however, perhaps a larger percentage of the users would be public and quasi-public agencies. Their short budgeting cycles makes it very difficult for them to commit financial resources on the long-term basis needed by any network operator.

These institutional constraints, in total, pose a sufficient barrier to indicate that network implementation will require a degree of inter-institutional cooperation not notably in evidence at present.

Conversely, however, the stimuli which tend to force such cooperation and action are those of cost reduction and energy reduction, which can be expected to loom ever larger.

4. POLICY ISSUES

The metropolitan cities and counties with whom TMC has worked have indicated their concurrence both in the needs surveys and the related economic analyses. Their task at this point is to establish the appropriate structures to facilitate the construction, operation and regulation of the telecommunications networks.

In some cases, the metropolitan institutional communications network is being considered as a smaller element of a home subscriber cable television system. In others, it is

being evaluated as a separate installation, independently owned and operated. For Portland, as an example, a separate study was sponsored by eight public institutions (City of Portland, Multnomah County, Portland Public Schools, Multnomah County Intermediate Education District, Portland State University, Lewis and Clark College, Mt. Hood Community College, Oregon Museum of Science and Industry) to determine the relative costs and benefits, as a group, of a county-wide institutional cable network. The conclusions of the study were that at least two additional major user groups would be required for system self-sufficiency, but if this could be attained, no insuperable barrier would exist to a consortium of users owning the network, perhaps with outside facility management.

Consequently, ownership and operation options are open, although as a practical matter an entrepreneurial structure appears likely in most situations. Under either alternative, however, several major policy issues remain to be resolved:

- If such metropolitan-area broadband networks are constructed, outside the AT&T purview, some consensus must be reached on their classification. They bear some relation to intrastate common carriers, but under some options, the owning/operating entities may also provide programming. They may be part of a cable television system, or they may not.

They very likely, either initially or later, will cross local franchising jurisdictions.

- For most users, end-to-end services are desired, rather than simply channel leasing. Interface equipment may be video, digital or audio. A network operator, in providing such end-to-end services crosses additional jurisdictional lines, perhaps combining a regulated distribution network with unregulated terminal/interface/computer services.
- User participation in planning and growth of the network will be essential, since many services are cost-effective only if provided inter-institutionally. Further, the user mix may include both the public and private sector. Such continuing user participation may, to some extent, mitigate against a straightforward common-carrier approach.

The long-range solutions to these policy issues do not appear evident at present. In the short-term, however, one or more of the concerned metropolitan areas may provide a prototype for further analysis and evaluation.

APPENDIX A

TELECOMMUNICATIONS NEEDS AND SERVICES

HAMILTON COUNTY, OHIO

TABLE A-1

POTENTIAL USE OF CABLE COMMUNICATIONS

GOVERNMENT AGENCIES -- HAMILTON COUNTY (EXCLUDING CINCINNATI)

AGENCY	COMMUNICATIONS SERVICE A = High Priority B = Moderate Priority C = Low Priority	COMMUNICATING LOCATIONS		ESTIMATED USAGE	SPECIAL REQUIREMENTS
		ORIGINATION	RECEPTION		
Hamilton County Commission	(A) Communications to the public (A) Communications among public agencies (A) Communications among Municipalities and Townships	• County building • Interconnection among municipal City Halls	• All County agencies • Cable system home subscribers, community centers	Shared-channel usage	• Private channel for internal use
Communications Center	(A) Operations and Admin. (B) Data Interchange (C) Training & Education	County Communications Center for video 111 Locations for data/voice (police, fire & rescue unit station houses)	111 Locations for video, data/voice	Shared usage for video Full-time data/audio subchannels	• Prefer 1-way video with audio talkback, plus 2-way data/voice subchanne • Information privacy • Fail-safe reliability
Regional Planning Commission	(A) Access to the public • Information distribution re. proposed plans • Citizen reaction	County Building(s)	• General public • Specific locations	Shared usage 1-2 hrs. per week	• Initially, 1-way video • Later, 1-way video with audio talkback to selected locations, e.g., County libraries
Criminal Justice	(A) Video courtroom testimony, legal conferences (A) Prisoner Education & Training	• County Buildings • District Attorney, Public Defenders	• Jails and correction facilities	1 channel	• Private channel operation • Information Privacy
Libraries	(A) Access to the Public (library-produced programs) (B) Use as Public Access Center (B) Use as Production Centers (B) Inter-Library Comm.	• From selected libraries branches • Interconnection among all libraries (37 in County)	• From selected branches • Interconnection among all libr libraries • Community Centers Homes, Institutions	1 channel eventually, shared-usage initially	• Link to home subscribers for 1-way information programming
Sheriff's Department	(A) Operations & Admin. (remote identification, etc.) (A) Data Interchange (A) Training & Education	Interconnection among all public safety agencies in County (2-way video & data)	Interconnection among all public safety agencies in County (2-way video & data	1 channel initially plus data/voice subchannels	• Private channel operations • Information privacy • Fail-safe reliability

TABLE A-2

POTENTIAL USE OF CABLE COMMUNICATIONS

GOVERNMENT AGENCIES - CITY OF CINCINNATI

AGENCY	COMMUNICATIONS SERVICE A = High Priority B = Moderate Priority C = Low Priority	COMMUNICATING LOCATIONS		ESTIMATED USAGE	SPECIAL REQUIREMENTS
		ORIGINATION	RECEPTION		
• Office of the Mayor • City Council	(A) Communications to Public (B) Communications among City Departments	City Hall	• All City Agencies • All Cable Subscriber Homes & Community Centers	Shared Channel Usage with City Depts.	• Private Channel for internal use
Department of Safety - Fire Division	(A) Training & Education of Fire Personnel via video links to Fire Stations (A) Operations & Administration (A) Data Interchange (B) Fire Dispatching (B) Fire Prevention	5 Locations (HQ, Admin., Training)	30 Fire Stations throughout City	1 Full-time Video Channel + Audio & Data Subchannels	• Private Channel • Audio talkback capability from each Fire Station • Mobile unit(s) for Fire Fighting • Fail-safe reliability • Link to home subscribers for fire prevention communications
Department of Safety - Police Division	(A) Link to Courts for video testimony of police officers (A) Education & Training (A) Data Interchange (A) Traffic & Area Surveillance via TV (B) Operations & Admin. (C) Access to Public	43 Locations -- Interconnection of all Police and Criminal Justice Facilities with 2-way video & data capability	43 Locations -- Interconnection of all Police & Criminal Justice Facilities with 2-way video & data capability	1 Full-time Video Channel + Audio & data Subchannels	• Private Criminal Justice Channel(s) • Information Privacy • Fail-safe reliability • Links to Courts, County State & Federal law enforcement agencies, prosecutor's office, civil defense, weather bureau
Department of Safety - Communications Division	(A) Training & Education of all City agencies particularly public safety services (A) Data Interchange (B) Operations & Admin. (B) Access to Public	10 Locations (Communications, Police, Fire facilities, State Highway Patrol)	125 Locations (Communications, Fire, Police Stations)	1 Full-time Video Channel + Audio & Data Subchannels	• Prefer 1-way video with audio talkback, plus 2-way data/voice subchannels • Information Privacy and Fail-safe reliability

(Govt. Agencies - City of Cincinnati - Cont.)

AGENCY	COMMUNICATIONS SERVICE A = High Priority B = Moderate Priority C = Low Priority	COMMUNICATING LOCATIONS		ESTIMATED USAGE	SPECIAL REQUIREMENTS
		ORIGINATION	RECEPTION		
City Planning Commission	(A) Distribution of Community Planning Information (A) Augmented Community Participation in Planning Process (B) Teleconferences with Related Agencies (B) Data Interchange	Teleconferencing among 20-30 Planning Commission, UKI, City Agencies, Social Service Agencies, & Community Centers Data Interchange among selected locations	Teleconferencing among 20-30 Planning Commission, UKI, City Agencies, Social Service Agencies & Community Centers Data Interchange among selected locations	Shared channel usage Estimated 5 hrs. video/week, 10 hrs. audio/data	• Prefer 2-way interactive video for community center teleconferencing • Occasional 1-way video for information distribution
Department of Health	(A) Operations and Administration (A) Data Interchange (B) Access to the Public (C) Training & Education	25 Locations Data Interchange among clinic sites, nursing & sanitation districts	25 Locations, Data Interchange among clinic sites, nursing and sanitation districts	Data transmission on continuous basis Video/Audio occasional	• Full-time data subchannels • Information privacy
Department of Finance	(A) Data Interchange (B) Operations and Administration (C) Training & Education	50 Locations, Data Interchange among Finance district locations and other City and County Agencies	50 Locations, data interchange among Finance district locations and other City and County Agencies	Data transmission on continuous basis Video/Audio occasional	• Full-time data subchannels • Information privacy • Fail-safe reliability

TABLE A-3

POTENTIAL USE OF CABLE COMMUNICATIONS

EDUCATIONAL INSTITUTIONS

AGENCY	COMMUNICATIONS SERVICE A = High Priority B = Moderate Priority C = Low Priority	COMMUNICATING LOCATIONS		ESTIMATED USAGE	SPECIAL REQUIREMENTS
		ORIGINATION	RECEPTION		
Cincinnati Public Schools	(A) Computer-Assisted and Computer-Managed Instruction (A) Instructional, Interactive TV (A) Security monitoring systems (A) Data Interchange (A) In-service training (B) Off-campus GEC and adult education	• Instructional Resource Centers • Administrative Offices • Selected High Schools	• All public schools • Community Centers libraries and homes for off-campus programs	4-6 channels plus data subchannels	• Private channel capability • One-way video with audio talkback preferr. plus 2-way data • Possible links to colleges, libraries, museums
Archdiocese of Cincinnati Parochial Schools	Generally similar to public school requirements.	• Archdiocese Center • Instructional Resource Center(s) • Selected Secondary Schools	• All Parochial schools • Community Centers libraries and homes	2-4 channels plus data subchannels	• Private channel capability • 1-way video with audi talkback preferred pl 2-way data • Possible links to colleges, libraries, museums
Hamilton County Public Schools	Generally similar to public school requirements. Greater distances involved make effective communications more important.	• County Board of Education Office	• All County Schools	1-2 channels plus data subchannels	• Private channel capability • 1-way video with audio talkback preferred plus 2-way data • Possible links to colleges, libraries, museums
Colleges & Universities (Compendium of responses from individual institutions including: U. of Cinc., Xavier U., Miami U., Thomas More College, Cinc. Tech. College & Hebrew Union College)	(A) Interconnection among colleges for selected video courses (A) Extension of education off-campus (A) Intra-campus closed-circuit video (A) Data Interchange (B) Admin. Communications	• Full 2-way video & 2-way data interconnection among participants of consortium	• Full 2-way video & 2-way data interconnection among participants of consortium • 1-way video to community centers libraries, homes	1-2 channels initially on shared-usage basis, plus data subchannels	• All video among institutions to have talkback capability • Private channels for internal and intercollege use

(Educational Institutions - Cont.)

AGENCY	COMMUNICATIONS SERVICE A = High Priority B = Moderate Priority C = Low Priority	COMMUNICATING LOCATIONS		ESTIMATED USAGE	SPECIAL REQUIREMENTS
		ORIGINATION	RECEPTION		
WCET-TV (Channel 48) (Public Broadcast System affiliate)	• With new studio facilities under construction, WCET is interested in: Production of programming under both its own and outside sponsorship for: -- general adult viewing -- minority interest programming -- continuing professional education (doctors, etc.) -- primary and secondary level education -- community interest programs	Programs would originate from any point in the cable system, and WCET too in some cases	All cable system viewers, or selected private channel viewers, as desired	Depends on level of production	• WCET and other agencies would cooperate in outreach and community-level programming

TABLE A-4

POTENTIAL USE OF CABLE COMMUNICATIONS

HEALTH CARE INSTITUTIONS

AGENCY	COMMUNICATIONS SERVICE A = High Priority B = Moderate Priority C = Low Priority	COMMUNICATING LOCATIONS		ESTIMATED USAGE	SPECIAL REQUIREMENTS
		ORIGINATION	RECEPTION		
University of Cincinnati Medical Center	(A) Training & Education (A) Data Interchange (A) Access to the Public - Health Information (A) Health Care Delivery (B) Operations & Admin.	50-100 Locations Interconnection among all major Health Care institutions for video & data interchange (Hospitals, clinics, nursing schools, group practices)	50-100 Locations Interconnection among all major Health Care institutions for video & data interchange (Hospitals, clinics nursing schools, group practices)	Initially, 2-3 full-time video channels plus data/voice subchannels	• Some locations require full 2-way interactive video capability (e.g. telediagnosis) • Most locations require video reception with audio talkback • Information privacy • Fail-safe reliability
Greater Cincinnati Hospital Council	(A) Training & Education (A) Data Interchange	25 Hospital locations interconnected	25 Hospital locations interconnected	Initially, shared channel use	• Some locations require full 2-way interactive video capability (e.g. telediagnosis) • Most locations require video reception with audio talkback • Information privacy • Fail-safe reliability
Children's Hospital Medical Center	(A) Training & Education (A) Operations & Admin. (A) Data Interchange	20 Locations - Interactive, 2-way video link	20 Locations - Interactive, 2-way video link	Shared-channel usage	• Interconnection to all area universities, health clinics, hospit • Information privacy • Fail-safe reliability
Ambulatory Patient Care, Inc.	(A) Training & Education (A) Operations & Admin. (B) Data Interchange (B) Access to the public	• 5 Interconnected locations - video and data • Link to General Hospital	• 5 Interconnected locations - video & data • Link to General Hospital	Shared-channel usage	• Some locations require full 2-way interactive video capability (e.g. telediagnosis) • Most locations require video reception with audio talkback • Information privacy • Fail-safe reliability

TABLE A-5

POTENTIAL USE OF CABLE COMMUNICATIONS

MISCELLANEOUS

AGENCY	COMMUNICATIONS SERVICE A = High Priority B = Moderate Priority C = Low Priority	COMMUNICATING LOCATIONS		ESTIMATED USAGE	SPECIAL REQUIREMENTS
		ORIGINATION	RECEPTION		
Social Service Agencies (Compendium of responses from individual agencies including: Children's Home, Council on Aging, Lincoln Heights Neighborhood Services, Hamilton Cty Council for Retarded Citizens, Ohio Valley Goodwill Industries)	(A) Training & Education (A) Access to the Public (A) Data Interchange	• Interconnection among some social agencies • Interconnection with government agencies (welfare, health depts., employment office) • Interconnection to community centers	• Interconnection among some social agencies • Interconnection with government agencies (welfare, health depts., empl. office) • Interconnection to community centers	Shared-channel usage Plus data/voice subchannels	• Two-way video needed only in selected applications • Information privacy
Southwestern Ohio Regional Computer Center (SWORCC)	(A) Education, specifically computer-assisted instruction (A) Data Interchange	Interconnection among all SWORCC users	Interconnection among all SWORCC users	Full-time data subchannels for major users	• Private channel operation • Information privacy • Fail-safe reliabili
Information Systems Center	(A) Data Interchange (B) Training & Education (B) Operations & Admin. (C) Access to the Public	Primary data exchange, information base access and referral among social service agencies, city depts.	Primary data exchange, information base access and referral among social service agencies, city depts.	Full-time data subchannels for major users	• Private channel operation • Information privacy • Fail-safe reliabilit
Cincinnati Gas & Electric Co.	(A) Automatic Meter Reading (B) Data & Facsimile Interchange (B) Video teleconferencing	• Accessing and reading of meters in all homes • Video & data interconnection among CGE locations	• Access and reading of meters in all homes • Video & data interconnection among CGE locations	Full-time data subchannels	• Private channel operation • Information privacy • Fail-safe reliabili

TABLE A-6

POTENTIAL CHANNEL DEMAND

FOR INSTITUTICNAL COMMUNICATIONS

AGENCY	6 MHz VIDEO CHANNELS		3 KHz VOICE/DATA SUBCHANNELS	
	OUTBOUND	INBOUND	OUTBOUND	INBOUND
GOVERNMENT - County				
Hamilton County Comm.	S*	S	--	--
Municipal.& Townships	S	S	50	50
Communications Center	1	1	120	120
Regional Planning C.	S	S	--	--
Criminal Justice	1-2	1-2	50	50
Libraries	1	1	40	40
Sheriff	1	1	50	50
GOVERNMENT - Cincinnati				
Mayor/Council	S	S	--	--
Fire	1	1	30	30
Police	1	1	50	50
Communications	1	1	10	10
Planning Commission	S	S	--	--
Health	S	S	30	30
Finance	S	S	50	50
EDUCATION				
Cinci.Public Schools	4-6	4-6	150	150
Parochial Schools	2-4	2-4	50	50
County Pub. Schools	1-2	1-2	100	100
Colleges & Univ.	1-2	1-2	30	30
HEALTH CARE				
U.of Cinci.Med.Center	2-3	2-3	100	100
City & County Hosp.	S	S	30	30
Clinics, Nursing Homes	S	S	30	30
PUBLIC/COMMUNITY	1	1	30	30
TOTALS	20-26	20-26	1,000**	1,000**

*S=Shared Channel (arbitrarily counted as equivalent of 1/4 channel).
**Can be accommodated in 2 video channels.

APPENDIX B

TELECOMMUNICATIONS NEEDS AND SERVICES

METROPOLITAN NASHVILLE AND

DAVIDSON COUNTY, TENNESSEE

TABLE B-1

POTENTIAL INSTITUTIONAL USES OF CABLE

(A) METRO GOVERNMENT AGENCIES

AGENCY	COMMUNICATIONS SERVICE OF INTEREST	PRIORITY A-High B-Moderate C-Low	COMMUNICATIONS LOCATIONS		ESTIMATED USAGE	SPECIAL REQUIREMENTS					
			ORIGINATION	RECEPTION		PRIVATE CHANNEL	INFO. SECURITY	1-WAY AUDIO TALKBACK	2-WAY VIDEO	2-WAY DATA	OTHER
Office of the Mayor	*Communications with Metro Departments	A	Mayor's Office	All Metro Agencies	Shared-channel usage with Metro Agencies	X		X	?	?	
	*Communications to the Public	B	Mayor's Office	Cable Subscriber Homes, Community Centers, Libraries	Shared-channel usage with Metro Agencies						1-Way
Metropolitan Council	*Communications with Metro Departments	A	Council Chambers	All Metro Agencies	Shared-channel usage with Metro Agencies	X		X	?	?	
	*Communications to the Public	B	Council Chambers	Cable Subscriber Homes, Community Centers, Libraries	Shared-channel usage with Metro Agencies						1-Way
Police Dept.	*Communications with Police Substations	A	Metro Safety Building	3 Substations, Youth Div.	Full-time, 2-Way Channel	X	X		X	X	
	*Training of Officers	A	Training Ctr.	3 Substations, Youth Div., Safety Bldg.	Full-time, 1-Way, Talkback Channel	X	X	X			
	*Court Testimony of Officers by Video Link	A	Safety Bldg., Substations	All Courts	Full-time Channel	X			X		
	*Communications with Other Law Enforcement, Criminal Justice Agencies	B	Metro Safety Building	Courts, Dist. Atty., Sheriff, Jail, State & Fed. Agencies	Shared-usage Channel	X	X	X	?	X	
	*Traffic, area TV Surveillance	B	Mobile Unit, Field Location	Safety Bldg.	Shared-usage Channel	X	X	X			
Fire Dept.	*Training of Firemen by Video Link	A	Training Academy	27 Fire Stations	Full-time, 1-Way, Talkback Channel	X		X			
	*Administrative Communications	B	HQ, Offices	All locations	Shared use of above Channel	X		X			
	*Fire Dispatching	C	Alarm Station	All locations	Full-time, Voice/data	X	X			X	
	*Fire Fighting via Mobile Video Link	C	Mobile Unit, Field Location	HQ	Shared-usage Channel	X	X	X			
Planning Commission	*Distribution of area development plans	A	Metro Office Building	Cable Subscriber Homes, Community Ctr. & Libraries	Shared-usage Channel						1-Way
	*Teleconferencing of Public Meetings.	B	Metro Office Building	3-4 Public Meeting Places	Shared-usage Channel				X		
	*Data Interchange with other Agencies	B	Metro Office Building	Metro, State & Fed. Agencies	Shared-usage, Data Only	X				X	

(A) METRO GOVERNMENT AGENCIES (CONT.)

AGENCY	COMMUNICATIONS SERVICE OF INTEREST	PRIORITY A-High B-Moderate C-Low	COMMUNICATIONS LOCATIONS		ESTIMATED USAGE	SPECIAL REQUIREMENTS					
			ORIGINATION	RECEPTION		PRIVATE CHANNEL	INFO. SECURITY	1-WAY AUDIO TALKBACK	2-WAY VIDEO	2-WAY DATA	OTHER
Finance Dept.	*Data Interchange	A	Finance Dept. Offices	Data Processing Center, User Locations, Other Metro Departments	Full-time, Data Only	X	X			X	
	*Training and Education	B	Finance Dept. Offices	Data Processing Ctr, user locations, other Metro Dept.	Shared-usage Channel	X		X			
Sheriff	*Training and Education	A	Courthouse	Jails, Sheriff Offices	Shared-usage Channel	X		X	?		
	*Data and Record Interchange	A	Courthouse	Other Law Enforcement, Criminal Justice Agencies	Shared-usage Channel, Data Only	X	X			X	
Criminal Justice Agencies	*Video Testimony	B	Police Substations	All Courts	Full-time Channel	X			X		
	*Criminal Justice Agency Teleconferencing	B	Courts, D.A., Public Defender & Jails	Courts, D.A., Public Defender & Jails	Full-time Channel	X	X		X		
	*Data and Record Interchange	B	Courts, D.A., Public Defender & Jails	Courts, D.A., Public Defender & Jails	Full-time Channel					X	
Social Service Dept.	*Staff Training and Teleconferencing	A	Central Office	8 Field Off. & Centers	Shared-usage Channel	X	X	X	?		
	*Improved Client Communications and Services Delivery	B	Central Office	Field Offices, Employment Ctrs., Hosp., State Welfare	Shared-usage Channel	X	X	?	?		
	*Data Interchange	B	Central Office	Field Offices, Employment Ctrs., Hosp., State Welfare	Shared-usage Channel, Data Only	X	X			X	
Health Dept.	*Staff Training and Teleconferencing	A	Lentz Public Health Center	8-9 Health Ctr. & Clinics	Shared-usage Channel	X	X	X	?		
	*Public Health Programming	B	Lentz Public Health Center	Jails, Sr. Citizens' Homes	Shared-usage Channel						1-Way
Public Libraries	*High-Speed Facsimile Comm. among Libraries	A	Main Branch	All Library Branches	Full-time, Data Only					X	
	*Facsimile Comm. to Schools, Colleges	B	Main Branch	All Colleges & Schools	Full-time, Data Only					X	
	*Video Programming to Public	B	Main Branch	Cable Subscribers	Shared-usage Channel						1-Way
	*Access Centers to Public	B	Selected Branches	Cable Subscribers	Shared-usage Channel						1-Way

TABLE B-2

POTENTIAL INSTITUTIONAL USES OF CABLE

(B) EDUCATIONAL INSTITUTIONS

INSTITUTION	COMMUNICATIONS SERVICE OF INTEREST	PRIORITY A-High B-Moderate C-Low	COMMUNICATIONS LOCATIONS		ESTIMATED USAGE	SPECIAL REQUIREMENTS					
			ORIGINATION	RECEPTION		PRIVATE CHANNEL	INFO. SECURITY	1-WAY AUDIO TALKBACK	2-WAY VIDEO	2-WAY DATA	OTHER
Metro Public Schools	*Expansion of ITV Programming to Students	A	WDCN (?)	All Public Schools	3-4 Full-time Channels	X					1-Way
	*In-service Staff Training, Seminars, Workshops	A	Admin. Office, 3-4 School Facilities, WDCN (?)	All Public Schools	1 Full-time Channel	X		X	?		
	*Interactive Video Instruction	B	Admin Offices, 3-4 School Fac., WDCN(?)	All Public Schools	Shared-usage Channel	X		X			
	*Administrative Teleconferencing	B	Admin Offices	All Public Schools	Shared-usage Channel	X		X			
	*Data and Record Communications	A	Admin Offices	All Public Schools	Full-time, Data Only	X	X			X	
	*School Surveillance and Security	A	Selected Schools	Central Monitoring Facil.	Shared-usage Channel	X					
	*Off-Campus Video Education	C	Selected Schools	Off-campus Locations, Subscribers' Homes	Shared-usage Channel						1-Way
WDCN-TV (Ch. 8)	*Increased Distribution of ITV Programs to Schools via Cable	A	WDCN	All Schools	3-4 Full-time Channels	X					1-Way
	*Program Production facility for other Cable Users	A	WDCN	N/A	N/A						
	*Public Access Ctr. for Cable Users	B	WDCN	Cable Subscribers	Public Access Channel						1-Way
	*Increased Local Programming for Cable Viewing	B	WDCN	Cable Subscribers	Shared-usage Channel						1-Way
University of Tennessee at Nashville	*Increased Off-campus Education to Working Students	A	UTN Campus	Remote Classrooms in Metro, State, Fed. Office Bldgs., Businesses	Shared-usage Channel	X		X			
	*Video Course and Program Exchange with TSU	A	UTN Campus	TSU Campus	Shared-usage Channel	X		X	?		
	*Video Program Exchange with other Colleges & Univ.	B	UTN Campus	All Metro area Colleges	Shared-usage Channel	X		X	X		
	*Off-campus Education and Training to Special Locations	B	UTN Campus	Prisons, Jails, Hospitals	Shared-usage Channel	X		X	?		

(B) EDUCATIONAL INSTITUTIONS (CONT.)

INSTITUTION	COMMUNICATIONS SERVICE OF INTEREST	PRIORITY A-High B-Moderate C-Low	COMMUNICATIONS LOCATIONS		ESTIMATED USAGE	SPECIAL REQUIREMENTS					
			ORIGINATION	RECEPTION		PRIVATE CHANNEL	INFO. SECURITY	1-WAY AUDIO TALKBACK	2-WAY VIDEO	2-WAY DATA	OTHER
Tennessee State University	*Off-campus Adult Education	A	TSU Campus	Classrooms in 10-12 Schools, Community Ctr, & Libraries	Shared-usage Channel	X		X			
	*Consumer Education	B	TSU Campus	Above plus Cable Subscr.	Shared-usage Channel						1-Way
	*Video Course and Program Exchange with UTN, Other Colleges	B	TSU Campus	UTN and Other Campuses	Shared-usage Channel	X		X	?		
Vanderbilt University	*Video Program, Course & Data Exchange with 5 Nashville Univ. Ctr Colleges (Vanderbilt,Fisk,Meharry, Peabody,Scarritt)	A	VU Campus	4 Other Campuses	Shared-usage Channel	X		X	?	X	
	*Video Program Exchange with other Colleges & Univ.	B	VU Campus	Other College Campuses	Shared-usage Channel	X		X	?		
	*Increased On-campus Video Use	V	VU Campus	VU Campus	N/A						
Peabody College	*Student Teacher Performance Monitoring	A	Classrooms in Selected Public Schools	Peabody Campus	Shared-usage Channel	X		X	?		
	*Video Program Exchange with other Colleges, Univ.	B	Peabody Campus	Other Metro-area Campuses	Shared-usage	X			X		
Fisk University	*Video Program Course & Data Exchange with Other NUC Colleges	A	Fisk Campus	4 Other Campuses	Shared-usage Channel	X		X	?	X	
	*Off-Campus Education	B	Fisk Campus	Classrooms in Community Centers, Libraries,etc.	Shared-usage Channel	X		X			

(B) EDUCATIONAL INSTITUTIONS (CONT.)

INSTITUTION	COMMUNICATIONS SERVICE OF INTEREST	PRIORITY A-High B-Moderate C-Low	COMMUNICATIONS LOCATIONS		ESTIMATED USAGE	SPECIAL REQUIREMENTS					
			ORIGINATION	RECEPTION		PRIVATE CHANNEL	INFO. SECURITY	1-WAY AUDIO TALKBACK	2-WAY VIDEO	2-WAY DATA	OTHER
Belmont College, David Lipscomb College, Scarritt College, Trevecca Nazarene College, Aquinas Jr. College, Nashville State Technical Institute	*Three colleges, as smaller institutions, may be interested in specialized video courses produced by others, and made available to their on-campus students	B	?	Campus of User College	Shared-usage Channel	X		X			
Joint University Library	*High-Speed Facsimile Exchange service among all public & Educational Libraries	A	JUL	25-26 Libraries in County	Full-time, Data Only	X				X	
	*Facsimile and Data Reference Service to Business	B	JUL	Business Customers	Full-time, Data Only	X				X	
	*Reference and Coordination Service for Continuing Professional Education & In-service Training	B	JUL	User Locations	Shared-video Channel use, Full-time Data	X		X		X	

TABLE B-3

POTENTIAL INSTITUTIONAL USES OF CABLE

(C) HEALTH CARE INSTITUTIONS

INSTITUTION	COMMUNICATIONS SERVICE OF INTEREST	PRIORITY A-High B-Moderate C-Low	COMMUNICATIONS LOCATIONS		ESTIMATED USAGE	SPECIAL REQUIREMENTS					
			ORIGINATION	RECEPTION		PRIVATE CHANNEL	INFO. SECURITY	1-WAY AUDIO TALKBACK	2-WAY VIDEO	2-WAY DATA	OTHER
Meharry Medical College	*Interactive Communications for Staff Training and Continuing Education	A	Meharry Campus	Hubbard Hosp, Walker Health Ctr.,Prisons	Shared-usage Channel	X	X	X	?		
	*Teleconferencing, Video Programs and Course Exchange with Vanderbilt Med.Ctr., & Other Hospitals	B	Meharry Campus	VU Campus, Selected Hospitals, Clinics	Shared-usage Channel	X	X		X		
	*Communications to Community Centers, Physicians, Offices	B	Meharry Campus	Physician Cable Subscr. Selected Community Ctr	Shared-usage Channel	X	X	?			1-Way
	*Teleconferencing, Video Program Exchange to Meharry, metropolitan area hospitals	A	VU Campus	Meharry, major hospitals	Shared-usage Channel	X	X	X	?		
	*Health Care Programming for Continuing Professional Education, Public Health	B	VU Campus	Medical Professional among cable subscribers, selected community ctr	Shared-usage Channel	X	X				1-Way
Metropolitan General Hospital	*Teleconferencing, Telediagnosis Links to Medical Centers & Bordeaux Hosp.	A	General Hosp.	VU & Meharry Campuses, Bordeaux Hospital	Shared-usage Channel	X	X	X	?		
	*Communications to Outpatient Clinics for Staff Training	B	General Hosp.	Selected Clinics	Shared-usage Channel	X	X	X	?		
	*Data Interchange	A	General Hosp.	Data Center, Blue Cross, Blue Shield, Medicare, Medicaid	Shared-usage Channel, Data Only	X	X			X	
V.A. Hospital	*Teleconferencing, Telediagnosis Links to Medical Centers	A	V.A. Hosp.	Vanderbilt, Meharry Med. Center	Shared-usage Channel	X	X	X	?		
	*Staff Training, Residents and Allied Health Professions	A	Med. Centers, Other Hosp.	V.A. Hosp.	Shared-usage Channel	X	X	X			

TABLE B-4

POTENTIAL CHANNEL DEMAND

LOCAL GOVERNMENT, EDUCATIONAL, HEALTH CARE COMMUNICATIONS

AGENCY	6 MHz VIDEO CHANNELS		3KHz VOICE/DATA SUBCHANNELS	
	OUTBOUND	INBOUND	OUTBOUND	INBOUND
Metro Government				
Mayor	S*	S	20	20
Metro Council	S	S	50	50
Police	2-3	2-3	30	30
Fire	1	1	30	30
Planning	S	S	10	10
Finance	S	S	100	100
Sheriff	S	S	10	10
Crim.Justice/Courts	1-2	1-2	30	30
Social Services	S	S	10	10
Health	S	S	10	10
Public Libraries	S	S	50	50
Education				
Metro Schools/WDCN	4-6	2-3	150	150
UTN	S	S	10	10
TSU	S	S	10	10
Vanderbilt	S	S	10	10
Peabody	S	S	10	10
Fisk	S	S	10	10
Other Colleges (total)	S	S	10	10
Joint Univ. Library	S	S	50	50
Health Care				
Meharry Med. College	S	S	10	10
Vanderbilt Med. Center & Nursing School	S	S	20	20
Metro General Hospital	S	S	30	30
V.A. Hospital	S	S	20	20
Other Hospitals, Clinics	S	S	20	20
TOTALS	13-16	11-13	710**	710**

*S = Shared-usage channel (arbitrarily assumed as equivalent of using 1/4 channel).

**Can be provided with the frequency spectrum of 2 video channels.